

4.12 CLIMATE CHANGE

This section addresses the potential impacts associated with greenhouse gas emissions that would occur as a result of the proposed project. The analysis contained in this section is based on the *Huntington Beach Desalination Plant Energy Minimization and Greenhouse Gas Reduction Plan* (Poseidon Resources Corporation 2010). Offset programs identified in the Huntington Beach Desalination Plant Energy Minimization and Greenhouse Gas Reduction Plan serve as design features associated with the proposed project.

Impacts are analyzed for both the co-located and stand-alone scenarios of the desalination facility operation. Direct impacts resulting from greenhouse gas emissions would be the same for both the co-located and stand-alone scenarios. Indirect impacts, however, are discussed separately for the co-located and stand-alone scenarios, as impacts would be different.

BACKGROUND AND EXISTING CONDITIONS

GLOBAL CLIMATE CHANGE

Earth's climate has undergone many changes during its history, ranging from ice ages to long periods of warmth. Natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy from the Sun have affected global temperatures and thus Earth's climate. Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer) (EPA 2008a). The term climate change is often used interchangeably with the term global warming; however, the phrase "climate change" is preferred as it helps convey that there are other changes in addition to rising temperatures (NAS 2008).

GREENHOUSE GASES

Heat retention within the atmosphere is an essential process to sustain life on Earth. The natural process through which heat is retained in the troposphere¹ is called the "greenhouse effect." The greenhouse effect traps heat in the troposphere through a three-fold process as follows: short-wave radiation emitted by the Sun is absorbed by Earth; Earth emits a portion of this energy in the form of long-wave radiation; and greenhouse gases (GHGs) in the upper atmosphere absorb this long-wave radiation and emit this long-wave radiation into space and toward Earth. This "trapping" of the long-wave (thermal) radiation emitted back toward Earth is the underlying process of the greenhouse effect. This natural process contributes to regulating Earth's temperature without which the temperature of Earth would be about 0°F (-18°C) instead of its present 57°F (14°C) (NCDC 2008).

Gases that trap heat in the atmosphere are often called GHGs. Section 38505(g) of the California Health and Safety Code identifies the following seven GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human

¹ The troposphere is the bottom layer of the atmosphere, which varies in height from Earth's surface to 10 to 12 kilometers.

activities. Man-made GHGs, which have a much greater heat-absorption potential than CO₂, include fluorinated gases, such as HFCs, PFCs, SF₆, and NF₃, which are associated with certain industrial products processes. Black carbon or BC is formed through the incomplete combustion of fossil fuels, biofuel, and biomass. Black carbon is not one of the seven greenhouse gases identified in Health & Safety Code § 38505(g), although some have advocated for its inclusion.²

It is generally thought that human activity has been increasing the concentration of GHGs in the atmosphere (mostly CO₂ from combustion of coal, oil, and gas, and a few other trace gases) (NCDRC 2008). While there is still debate whether or not human activity is directly contributing to measurable climate change, the global atmospheric concentration of CO₂ has increased from a pre-industrial value of about 280 to 379 parts per million (ppm) in 2005 (IPCC 2007a). Based on current rates of increase, CO₂ concentrations could reach between 490 to 1260 ppm by the end of the 21st century, 75% to 350% above the preindustrial concentration (IPCC 2001).

A warming trend of approximately 1.0°F to 1.7°F occurred during the 20th century; warming occurred in both the northern and southern hemispheres, and over the oceans (IPCC 2007a). Most of the warming in recent decades could be the result of human activities (IPCC 2007a). However, there is much uncertainty concerning the magnitude and rate of the warming. The U.S. Environmental Protection Agency (EPA) notes that "important scientific questions remain about how much warming will occur, how fast it will occur, and how the warming will affect the rest of the climate system, including precipitation patterns and storms" (EPA 2007).

The effect each GHG has on climate change is measured as a combination of the volume or mass of its emissions and the potential of a gas or aerosol to trap heat in the atmosphere, known as its global warming potential (GWP). The GWP varies between GHGs; for example, the GWP of CO₂ is 1, the GWP of methane is 21, the GWP of nitrous oxide is 310, and the GWP of sulfur hexafluoride is 23,900. Total GHG emissions are expressed as a function of how much warming would be caused by the same mass of CO₂. Thus, GHG gas emissions are typically measured in terms of pounds or tons of "CO₂ equivalent" (CO₂E).

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2°C per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using 2000 emission rates shows that further warming would occur, which would induce further changes in the global climate system during the current century. Changes to the global climate system and ecosystems and to California would include, but would not be limited to:

- The loss of sea ice and mountain snow pack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures (IPCC 2007a)

² No regulatory authority has classified black carbon as a greenhouse gas, and black carbon is not regulated under Assembly Bill 32, the primary legislation designed to reduce California's impact on climate change (or in any other law implemented to address global climate change). Thus, although the Project may indirectly generate minor amounts of black carbon, the quantities are indeterminable at this time. Further, the potential impact of black carbon emissions on climate change is also unknown at this time. Accordingly, black carbon is not analyzed herein.

- Rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps, the Greenland and Antarctic ice sheets (IPCC 2007a)
- Changes in weather that includes, widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones (IPCC 2007a)
- Decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California, by 70% to as much as 90% over the next 100 years (CalEPA 2006)
- Increase in the number of days conducive to ozone (O₃) formation by 25% to 85% (depending on the future temperature scenario) in high O₃ areas of Los Angeles and the San Joaquin Valley by the end of the 21st century (CalEPA 2006). Ozone formation occurs through a combination of VOC and NO_x emissions when they are exposed to sunlight.
- High potential for erosion of California's coastlines and sea water intrusion into the Delta and levee systems due to the rise in sea level (CalEPA 2006).

CONTRIBUTIONS TO GREENHOUSE GAS EMISSIONS

State of California

According to the 2004 GHG inventory data compiled by the California Air Resources Board (CARB), California was responsible for emissions of 484 Million Metric Tons of Carbon Dioxide Equivalent (MMTCO₂E), including emission resulting from out-of-state electrical generation (CARB 2007). The primary contributors to GHG emissions in California are transportation, electric power production from both in-state and out-of-state sources, industry, agriculture and forestry, and other sources, which include commercial and residential activities. These primary contributors to California's GHG emissions and their relative contributions in 2004 are presented in Table 4.12-1, Greenhouse Gas Sources in California.

**TABLE 4.12-1
 GREENHOUSE GAS SOURCES IN CALIFORNIA**

SOURCE CATEGORY	ANNUAL GHG EMISSIONS (MMTCO₂E)	PERCENT OF TOTAL
Agriculture	27.9	5.8%
Commercial uses	12.8	2.6%
Electricity generation	119.8 ^a	24.7%
Forestry (excluding sinks)	0.2	0.0%
Industrial uses	96.2	19.9%
Residential uses	29.1	6.0%
Transportation	182.4	37.7%
Other ^b	16.0	3.3%
Totals	484.4	100.0%

Notes:

a Includes emissions associated with imported electricity, which account for 61.3 MMTCO₂E annually

b Unspecified combustion and use of ozone-depleting substances.

Source: CARB 2007.

POTENTIAL EFFECTS OF CLIMATE CHANGE

Globally, climate change has the potential to impact numerous environmental resources though uncertain impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place, including substantial ice loss in the Arctic (IPCC 2007a).

However, the scientific understanding of the effect of GHG emissions, particulate matter, and aerosols on global climate trends remains uncertain. In addition to uncertainties about the extent to which human activity rather than solar or volcanic activity is responsible for increasing warming, there is also evidence that some human activity has cooling rather than warming effects (IPCC 2001).

Below is a summary of some of the potential effects reported by an array of studies that could be experienced in California as a result of global warming and climate change.

Air Quality

Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. For other pollutants, the effects of climate change and/or weather are less well studied and even less well understood. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (CCCC 2006).

Water Supply

Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. Studies have found that "considerable uncertainty about precise impacts of climate change on California hydrology and water resources will remain until we have more precise and consistent information about how precipitation patterns, timing, and intensity will change" (Kiparsky and Gleck 2003). Even assuming that climate change leads to long-term increases in precipitation, analysis of the impact of climate change is further complicated by the fact that no studies have identified or quantified the runoff impacts that such an increase in precipitation would have on particular watersheds (CCCC 2006). Also, little is known about how groundwater recharge and water quality will be affected. Higher rainfall could lead to greater groundwater recharge, although reductions in spring runoff and higher evapotranspiration could reduce the amount of water available for recharge (CCCC 2006).

The California Department of Water Resources' report on climate change and effects on the State Water Project (SWP), the Central Valley Project, and the Sacramento-San Joaquin Delta

concludes that "climate change will likely have a significant effect on California's future water resources [and] future water demand," yet it also reports that much uncertainty about future water demand remains (DWR 2006). Still, changes in water supply are expected to occur, and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows (Kiparsky and Gleck 2003).

Hydrology

As discussed above, climate change could potentially affect the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide, and high runoff events); sea-level rise and coastal flooding; coastal erosion; and the potential for saltwater intrusion. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture

California has a \$30 billion agricultural industry that produces half the country's fruits and vegetables. Higher CO₂ levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks (CCCC 2006).

Ecosystems and Wildlife

Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Soil moisture is likely to decline in many regions; intense rainstorms are likely to become more frequent; and sea level could rise as much as 2 feet along most of the United States coast. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events, (2) geographic range, (3) species' composition within communities, and (4) ecosystem processes such as carbon cycling and storage (Parmesan and Galbraith 2004).

Sea Level Rise

The California Global Warming Solutions Act of 2006 (Health and Safety Code Section 38501(a)), cites rising sea levels as a potential adverse impact of global warming. Several studies on the effects of climate change on sea levels have been conducted since the adoption of this provision, which are summarized below.

According to the California Climate Center's white paper entitled Projected Future Sea Level (March 2006), a historical rate of sea level rise approaching 2 millimeters per year (0.08 inches/year) was recorded for California tide gages, similar to the rate estimated for global mean sea level. Two climate models and three scenarios were used in the Center's white paper to develop a range of potential long-term sea level rise values. The mean sea level rise values range from approximately 0.10 to 0.72 meter (3.9 to 28 inches) from the year 2000 to the end of the century (2070 through 2100). The midpoint of the range for each of the three scenarios was 0.32 meter (13 inches), 0.38 meter (15 inches) and 0.44 meter (18 inches).

The Fourth Assessment Report of the IPCC concluded that continued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century including rising sea levels (IPCC 2007b). The IPCC used sophisticated climate models to carry out their analysis. Model-based projections of global average sea level rise predicted a range of sea level rise—between 18 and 76 cm (7 inches to 2.5 feet) by the end of this century.

More recent studies indicate that the amount of sea level rise by the end of this century will be between 7 and 82 cm, depending on the amount of warming that occurs. Dr Mark Siddall from the University of Bristol, together with colleagues from Switzerland and the US, developed a conceptual model that matches the sea level changes that have occurred since the end of the last ice age (Siddall et al. 2009). The new model predicts, between 7 and 82 cm (2.7 inches to 2.7 feet) of sea-level rise by the end of this century.

The California Department of Water Resources, CA (DWR) and US Bureau of Reclamation mid-pacific region (USBR), have recently developed a screening model for planning and management of State Water Project and Central Valley Project in California, named CalLite (February 2009). CalLite simulates water conditions in the Central Valley over an 82-yr planning period (water years 1922-2003) and simulates observed hydrologic regimes or future possible climate change hydrologic regimes. At present the two projected sea level rise scenarios have been developed and implemented in CalLite: 1 ft and 2 ft sea level rises.

The National Oceanic and Atmospheric Administration (NOAA) has estimated that the average rate of sea-level rise in Newport Beach (the closest location to Huntington Beach that has been analyzed) to be 1.2 to 3.3 mm in a given year, with a mean probabilistic rate of change at 2.22 mm/year (U.S. Army Corps EC 1165-2-211). Based on this rate of change, the National Research Council has developed a series of equations to determine the probable sea-level rise. Using the localized rate of sea-level change for the Newport Beach area, by the year 2025 there could be an approximate .47-foot rise in sea level, and by 2050 there could be up to 1.59 feet rise in sea level.

REGULATORY FRAMEWORK

Numerous initiatives, policies and regulations have been adopted internationally, nationally and in the state of California to address climate change. California has taken a progressive approach to climate change and global warming and was one of the first states to adopt a law to track and reduce statewide greenhouse gas emissions. AB 32, the California Global Warming Solutions Act, is the prevailing state statute addressing climate change.

INTERNATIONAL ACTIVITIES

Kyoto Protocol

The United States is, and has been, a participant in the United Nations Framework Convention on Climate Change (UNFCCC) since it was signed on March 21, 1994. The Kyoto Protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. The original Kyoto Protocol was negotiated in December 1997 and came into force on February 16, 2005. As of November 2009, 189 countries and the European Economic

Community (EEC) have ratified the agreement (UNFCCC 2009). The goal of the protocol is to achieve overall emissions reduction targets for six GHGs by the period 2008 to 2012. The United States has not ratified the Kyoto Protocol, and thus is not subject to any binding emission reduction targets. The Copenhagen Accord is the document that delegates at the United Nations Climate Change Conference (UNCCC) agreed to "take note of" at the final plenary session of the Conference on December 18, 2009. In that document, the United States proposed to cut GHG emissions by 17% below 2005 levels by 2020. While not binding, it indicates a federal intent to reduce GHG emissions.

FEDERAL ACTIVITIES

Federal Clean Air Act

Under the Bush administration, the EPA did not regulate GHGs under the Clean Air Act based on the assertion that "(1) the Act does not authorize it to issue mandatory regulations to address global climate change, and (2) even if it had the authority to set GHG emission standards, it would have been unwise to do so at that time because a causal link between GHGs and the increase in global surface air temperatures was not unequivocally established" (U.S. Supreme Court 2007). In *Massachusetts v. Environmental Protection Agency*, however, the Supreme Court held that EPA has the statutory authority under Section 202 of the Clean Air Act to regulate GHGs from new motor vehicles because GHGs meet the Clean Air Act definition of an air pollutant (U.S. Supreme Court 2007). The court did not hold that the EPA was required to regulate GHG emissions; however, it indicated that the agency must decide whether GHGs from motor vehicles cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. Upon the final decision, President Bush signed Executive Order 13432 on May 14, 2007, directing the EPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responds to the Supreme Court's decision.

In *Massachusetts v. EPA*, the Supreme Court directed the EPA Administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the Administrator is required to follow the language of Section 202(a) of the Clean Air Act. On December 7, 2009, the Administrator signed a final rule with two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- The Administrator is proposing to find that the current and projected concentrations of the mix of 6 key greenhouse gases—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the endangerment finding.
- The Administrator is further proposing to find that the combined emissions of CO₂, CH₄, N₂O, and HFCs from new motor vehicles and motor vehicle engines contribute to the atmospheric concentrations of these key greenhouse gases and hence to the threat of climate change. This is referred to as the cause or contribute finding.

Energy Independence and Security Act

On December 19, 2007, President Bush signed the Energy Independence and Security Act of 2007. Among other key measures, the act would do the following, which would aid in the reduction of national GHG emissions:

1. Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022
2. Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by Model Year 2020, and direct National Highway Traffic Safety Administration to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks
3. Prescribe or revise standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

National Fuel Efficiency Policy

On May 19, 2009, President Obama announced the National Fuel Efficiency Policy, which is aimed at both increasing fuel economy and reducing greenhouse gas pollution for all new cars and trucks sold in the United States. The new standards, covering model years 2012-2016, and ultimately requiring an average fuel economy standard of 35.5 mpg in 2016, are projected to save 1.8 billion barrels of oil over the life of the program with a fuel economy gain averaging more than 5% per year and a reduction of approximately 900 million metric tons in greenhouse gas emissions. This would surpass the standards set by the Energy Independence and Security Act.

Additionally, in June 2009 the EPA granted a Clean Air Act waiver of preemption to California. This waiver allows California to implement its own greenhouse gas emission standards for motor vehicles beginning with model year 2009.

STATE OF CALIFORNIA ACTIVITIES

Assembly Bill 1493

In a response to the transportation sector accounting for more than half of California's CO₂ emissions, Assembly Bill (AB) 1493 was enacted on July 22, 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set the GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards will result in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of about 30%.

In December 2004, these regulations were challenged in federal court by the Alliance of Automobile Manufacturers, which claimed that the law regulated vehicle fuel economy, a duty

assigned to the federal government. Upon the U.S. Supreme Court's decision in *Massachusetts v. EPA*, the U.S. District Court for the Eastern District of California dismissed the Alliance of Automobile Manufacturers' case in December 2007. However, before these regulations may go into effect, the EPA must grant California a waiver under the federal Clean Air Act, which ordinarily preempts state regulation of motor vehicle emission standards. On December 19, 2007, Stephen Johnson, the EPA Administrator, denied the waiver citing the need for a national approach to reducing GHG emissions, the lack of a "need to meet compelling and extraordinary conditions," and the benefits to be achieved through the Energy Independence and Security Act of 2007 (Johnson 2007). The California Attorney General subsequently filed suit in January 2008 to overturn the administrator's decision. The Obama Administration has reevaluated the waiver, and the waiver was granted by Lisa Jackson, the EPA Administrator, on June 30, 2009.

Senate Bill 1078

Approved by Governor Davis in September 2002, Senate Bill (SB) 1078 established the Renewal Portfolio Standard program, which requires an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010 (see SB 107). (See also Executive Order S-14-08.)

Executive Order S-3-05

In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80% below 1990 levels by 2050. The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Representatives from several state agencies comprise the Climate Action Team. The Climate Action Team is responsible for implementing global warming emissions reduction programs. The Climate Action Team fulfilled its report requirements through the March 2006 Climate Action Team Report to Governor Schwarzenegger and the legislature (CalEPA 2006). A second biennial report was released in April 2009.

The 2009 Draft Climate Action Team Report expands on the policy oriented in the 2006 assessment. The 2009 report provides new information and scientific findings regarding the development of new climate and sea-level projections using new information and tools that have recently become available and evaluates climate change within the context of broader soil changes, such as land use changes and demographics. The 2009 report also identifies the need for additional research in several different aspects that affect climate change in order to support effective climate change strategies. The aspects of climate change that were discussed that need future research include vehicle and fuel technologies, land use and smart growth, electricity and natural gas, energy efficiency, renewable energy and reduced carbon energy sources, low GHG technologies for other sectors, carbon sequestration, terrestrial sequestration, geologic sequestration, economic impacts and considerations, social science, and environmental justice.

Senate Bill 107

Approved by Governor Schwarzenegger on September 26, 2006, SB 107 requires investor-owned utilities such as Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric, to generate 20% of their electricity from renewable sources by 2010. Previously, state law required that this target be achieved by 2017 (see SB 1078).

Assembly Bill 32

The California Global Warming Solutions Act of 2006 (AB 32) was signed into law by Governor Schwarzenegger on September 27, 2006. AB 32's GHG emissions limit is equivalent to the 1990 levels, which are to be achieved by 2020. The 1990 levels are approximately 30% below "business-as-usual". Business as usual conditions represent what would occur in the absence of any GHG reduction actions. The California Air Resources Board (CARB) estimates the statewide 2020 business-as-usual GHG emissions will be 596 MMTCO₂E.

CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions. This program will be used to monitor and enforce compliance with the established standards. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

The first action under AB 32 resulted in the adoption of a report listing early action GHG emission reduction measures on June 21, 2007. The early actions include three specific GHG control rules. On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32. The original three adopted early action regulations meeting the narrow legal definition of "discrete early action GHG reduction measures" include the following:

- A low-carbon fuel standard to reduce the "carbon intensity" of California fuels
- Reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of "do-it-yourself" automotive refrigerants
- Increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.

The additional six early action regulations, which were also considered "discrete early action GHG reduction measures," include the following:

1. Reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology
2. Reduction of auxiliary engine emissions of docked ships by requiring port electrification
3. Reduction of perfluorocarbons from the semiconductor industry

4. Reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products)
5. Require that all tune-up, smog check and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency
6. Restriction on the use of SF₆ from non-electricity sectors if viable alternatives are available.

According to CARB, the electric power generation industry is the primary user of SF₆, a synthetic gas used as an insulating medium (CARB 2010). The use of SF₆, a highly potent GHG with a GWP 23,900 times greater than CO₂, is problematic because fugitive emissions can escape older gas-insulated substations and switchgear through insulation leaks. The most promising and cost-effective strategies to reduce SF₆ emissions is through the installation of new equipment, technologies and practices including leak detection, repair, use of recycling equipment and employer/employee training (CARB 2010). On February 25, 2010, CARB adopted a regulation that requires gas-insulated substations and switchgear owners to reduce their SF₆ emission rate by one percent per year over a ten year period, from 2011 to 2020. Beginning January 1, 2020, the maximum annual emission rate would be at one percent. The measure would also require gas-insulated substations and switchgear owners to: 1) annually report their SF₆ emissions; 2) annually report their emission rate; 3) provide a complete inventory of all gas insulated switchgear and their SF₆ capacities; 4) produce a SF₆ gas container inventory; and 5) keep all information current for ARB enforcement staff inspection and verification.

As required under AB 32, on December 6, 2007, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMTCO₂E. In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of GHGs for large facilities that account for 94% of GHG emissions from industrial and commercial stationary sources in California. About 800 separate sources that fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and other industrial sources that emit CO₂ in excess of specified thresholds. The proposed project does not fall under these new reporting rules.

On December 11, 2008, CARB approved the required Climate Change Scoping Plan (the "Scoping Plan") to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. Additional development of these measures and adoption of the appropriate regulations will occur over the next 2 years, becoming effective by January 1, 2012. Emission reductions from the recommended measures in the Scoping Plan total 169 MMTCO₂E, which will allow California to attain the 2020 emissions limit of 427 MMTCO₂E, a 30% reduction from CARB's 2020 estimated statewide business-as-usual GHG emissions of 596 MMTCO₂E. The key elements of the Scoping Plan include the following (CARB 2008a):

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards

- Achieving a statewide renewable energy mix of 33%
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

The strategies that are most relevant to the project are those related to energy efficiency programs and increasing the renewable energy component of the statewide electricity production portfolio.

Regarding energy efficiency, a Green Building Strategy offers a comprehensive approach to reducing direct and indirect GHG emissions that cross-cuts multiple sectors including Electricity/Natural Gas, Water, Recycling/Waste, and Transportation. Such a strategy would produce GHG savings through buildings that exceed minimum energy efficiency standards, decrease consumption of potable water, reduce solid waste during construction and operation, and incorporate sustainable materials.

Regarding renewable energy, California's retail electric load is currently comprised of approximately 12 percent renewable energy resources. Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas (CARB 2008c). California's current Renewables Portfolio Standard (RPS) is intended to increase that share to 20 percent by the end of 2010. Based on Governor Schwarzenegger's call for a statewide 33 percent RPS, the Scoping Plan anticipates that California will have 33 percent of its electricity provided by renewable resources by 2020.

The Scoping Plan does not recommend Indirect Source Rules (ISRs) and does not regulate indirect GHG emission sources (e.g., the proposed project). While industrial emitters are required to report their GHG emissions to CARB, this reporting requirement is not tied to regulatory mitigation.

Senate Bill 1368

In September 2006, Governor Schwarzenegger signed SB 1368, which requires the California Energy Commission (CEC) to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local, publicly owned utilities. These standards must be consistent with the standards adopted by the California Public Utilities Commission (CPUC). This effort will help to protect energy customers from financial risks

associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low or lower than new combined-cycle natural gas plants, by requiring imported electricity to meet GHG performance standards in California and requiring that the standards be developed and adopted in a public process.

Executive Order S-1-07

Issued on January 18, 2007, Executive Order S-1-07 sets a declining Low Carbon Fuel Standard (LCFS) for GHG emissions measured in CO₂ equivalent gram per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources such as algae, wood, and agricultural waste. In addition, the LCFS would drive the availability of plug-in hybrid, battery electric, and fuel-cell power motor vehicles. The LCFS is anticipated to replace 20% of the fuel used in motor vehicles with alternative fuels by 2020.

Senate Bill 97

In August 2007, the legislature enacted SB 97 (Dutton), which directs the Governor's Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of GHG emissions. OPR was to develop proposed guidelines by July 1, 2009, and the Natural Resources Agency was directed to adopt guidelines by January 1, 2010.

On June 19, 2008, OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents (OPR 2008). The advisory indicated that a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities, should be identified and estimated. The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures that are necessary to reduce GHG emissions to a less-than-significant level.

On April 13, 2009, OPR submitted to the Natural Resources Agency its proposed amendments to the state CEQA Guidelines relating to GHG emissions. On July 3, 2009, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting the proposed amendments, starting the public comment period.

The Natural Resources Agency adopted CEQA Guidelines Amendments on December 30, 2009 and transmitted them to the Office of Administrative Law on December 31, 2009. On February 16, 2010, the Office of Administrative law completed its review and filed the Amendments with the Secretary of State. The Amendments became effective on March 18, 2010. The amended guidelines establish several new CEQA requirements concerning the analysis of GHGs, including:

- Requiring a lead agency to “make a good faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project” (§15064(a))

- Providing a lead agency with the discretion to determine whether to use quantitative or qualitative analysis or performance standards to determine the significance of greenhouse gas emissions resulting from a particular project (§15064.4(a))
- Requiring a lead agency to consider the following factors when assessing the significant impacts from greenhouse gas emissions on the environment:
 1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting.
 2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional or local plan for the reduction or mitigation of greenhouse gas emissions. (§15064.4(b))
- Allowing lead agencies to consider feasible means of mitigating the significant effects of greenhouse gas emissions, including reductions in emissions through the implementation of project features or off-site measures, including offsets that are not otherwise required (§ 15126.4(c))

The amended guidelines also establish two new guidance questions regarding GHG emissions in the Environmental Checklist set forth in CEQA Guidelines Appendix G:

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The adopted amendments do not establish a GHG emission threshold, and instead allow a lead agency to develop, adopt and apply its own thresholds of significance or those developed by other agencies or experts.³ The Natural Resources Agency also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions.⁴

³ "The CEQA Guidelines do not establish thresholds of significance for other potential environmental impacts, and SB97 did not authorize the development of a statement threshold as part of this CEQA Guidelines update. Rather, the proposed amendments recognize a lead agency's existing authority to develop, adopt and apply their own thresholds of significance or those developed by other agencies or experts." Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines, p. 84.

⁴ "A project's compliance with regulations or requirements implementing AB32 or other laws and policies is not irrelevant. Section 15064.4(b)(3) would allow a lead agency to consider compliance with requirements and regulations in the determination of significance of a project's greenhouse gas emissions." Final Statement of Reasons, p. 100.

Senate Bill 375

In August 2008, the legislature passed and on September 30, 2008, Governor Schwarzenegger signed SB 375, which addresses GHG emissions associated with the transportation section through regional transportation and sustainability plans. By September 30, 2010, CARB will assign regional GHG reduction targets for the automobile and light truck sector for 2020 and 2035. The targets are required to consider the emission reductions associated with vehicle emission standards (see SB 1493), the composition of fuels (see Executive Order S-1-07), and other CARB-approved measures to reduce GHG emissions. Regional metropolitan planning organizations will be responsible for preparing a Sustainable Communities Strategy within the Regional Transportation Plan. The goal of the Sustainable Communities Strategy is to establish a development plan for the region, which, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If a Sustainable Communities Strategy is unable to achieve the GHG reduction target, a metropolitan planning organization must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies. SB 375 provides incentives for streamlining CEQA requirements by substantially reducing the requirements for "transit priority projects," as specified in SB 375, and eliminating the analysis of the impacts of certain residential projects on global warming and the growth-inducing impacts of those projects when the projects are consistent with the Sustainable Communities Strategy or Alternative Planning Strategy.

Executive Order S-13-08

Governor Schwarzenegger issued Executive Order S-13-08 on November 14, 2008. The Executive Order is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. It directs state agencies to take specified actions to assess and plan for such impacts. It directs the Resource Agency, in cooperation with the California Department of Water Resources, CEC, California's coastal management agencies, and the Ocean Protection Council to request the National Academy of Sciences to prepare a Sea Level Rise Assessment Report by December 1, 2010. The Ocean Protection Council, California Department of Water Resources, and CEC, in cooperation with other state agencies are required to conduct a public workshop to gather information relevant to the Sea Level Rise Assessment Report. The Business, Transportation, and Housing Agency was ordered to assess the vulnerability of the state's transportation systems to sea-level rise within 90 days of the order. The OPR and the Resources Agency are required to provide land use planning guidance related to sea-level rise and other climate change impacts. The order also requires the other state agencies to develop adaptation strategies by June 9, 2009 to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years.

Executive Order S-14-08

On November 17, 2008, Governor Schwarzenegger issued Executive Order S-14-08. This Executive Order focuses on the contribution of renewable energy sources to meet the electrical needs of California while reducing the GHG emissions from the electrical sector. The governor's order requires that all retail suppliers of electricity in California serve 33% of their load with renewable energy by 2020. Furthermore, the order directs state agencies to take appropriate actions to facilitate reaching this target. The Resources Agency, through collaboration with the

CEC and California Department of Fish and Game (CDFG), is directed to lead this effort. Pursuant to a Memorandum of Understanding between the CEC and CDFG creating the Renewable Energy Action Team, these agencies will create a "one-stop" process for permitting renewable energy power plants.

Executive Order S-21-09

On September 15, 2009, Governor Schwarzenegger issued Executive Order S-21-09. This Executive Order directed CARB to adopt a regulation consistent with the goal of Executive Order S-14-08 by July 31, 2010. CARB is further directed to work with the CPUC and CEC to ensure that the regulation builds upon the Renewable Portfolio Standard program and is applicable to investor-owned utilities, publicly owned utilities, direct access providers, and community choice providers. Under this order, CARB is to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health and that can be developed most quickly in support of reliable, efficient, and cost-effective electricity system operations.

LOCAL ACTIVITIES

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider the global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan (AQMP).

In February 2008, the Governing Board of the SCAQMD approved development of the SoCal Climate Solutions Exchange, which aims to provide high quality GHG emissions reductions. The proposed rules include staff's initial recommendations for the rule language for SoCal Climate Solutions Exchange and a GHG Air Quality Investment Program (AQIP). An AQIP would enable the SCAQMD to collect funds from parties that need certified emission reductions, pool those funds, and use them to reduce GHGs.

In December 2008, the SCAQMD adopted an interim threshold of 10,000 MTCO₂E/yr (direct and indirect operational emissions plus construction emissions amortized over 30 years) for "industrial" projects for which the SCAQMD is the lead agency, and it is in the process of developing guidelines for projects for which other agencies are the lead agency.

IMPACTS

METHOD OF ANALYSIS

This analysis focuses on the nature and magnitude of the change in GHG emissions due to implementation of the proposed project. The calculation of GHG emissions in this analysis is based on protocols adopted by the California Climate Action Registry (CCAR). The proposed project's seawater desalination process itself does not emit greenhouse gases; therefore, direct GHG emissions associated with the proposed project would result from project construction, as

well as from operational vehicles. Indirect GHG emissions would result from the electricity use required to power the desalination facility.

As a project design feature, the project applicant has prepared an Energy Minimization and Greenhouse Gas Reduction Plan (the Plan) as part of its commitment to account for and bring to zero the net indirect GHG emissions associated with the proposed project (Appendix W). The Plan, prepared by Renewable Resources Group, includes a quantification of the proposed project's direct and indirect GHG emissions, as well as a quantification of the project-related reduction of GHG emissions. Offset programs identified in the Plan serve as design features associated with the proposed project, as indicated in Section 3.4 of this EIR. It is also anticipated that this project feature will be made enforceable by the City as a condition of approval of the project. The analysis provided below is based on the findings of the Plan. Refer to Appendix W for further details regarding analysis methodology and assumptions. The following is a summary of the impact avoidance and minimization measures contained in the Plan:

- Prior to the commencement of project construction and subject to City of Huntington Beach concurrence, the project applicant shall make a one-time purchase of GHG offsets or renewable energy credits (RECs) to zero-out the construction and aggregate 30-year direct operational GHG emissions associated with the proposed project. A quantification of those emissions is provided in the analysis section that follows.
- Prior to the commencement of project operations, the project applicant shall be required to purchase offsets sufficient to cover estimated net (indirect) GHG emissions (as quantified below) for at least the first year of operation, subject to City concurrence and based on the project's first annual GHG report. Following this initial purchase, the project applicant will have the option to purchase offsets for any longer period of time up to and including the entire 30-year life of the project.
- Each year, the project applicant shall obtain new GHG emission factors from CARB or CCAR and prepare and submit its annual GHG report within 180 days of the date of publication of CCAR/CARB emissions reports. If the report shows a positive net GHG emissions balance, the project applicant shall purchase offsets and submit proof of such purchase to the City within 120 days from the date of the annual GHG report.
- If, at any time during the life of the project, CARB, any California air district, or any federal regulatory agency initiates a carbon tax or carbon offset program that would allow the project applicant to purchase carbon offsets or payment of fees to compensate for GHG emissions, the project applicant may, at its option, elect to pay into such a program in order to fulfill all or part of its obligations under the Plan.

Importantly, while GHG emissions are typically measured in terms of pounds or tons of CO₂E, emissions from sources that are less than 5% of the total system-wide emissions are considered de minimis and are not required to be reported to CARB pursuant to AB 32. For Southern California Edison (SCE), CH₄, NO_x, and SF₆ are all less than 5% of the total system-wide emissions, and therefore would not be included in the "reported" emissions under the Climate Change Action Registry's (CCAR) General Reporting Protocol. While the proposed

project is not regulated under AB 32, consistent with AB 32 and the CCAR General Reporting Protocol, the proposed project's GHG emissions are reported in terms of pounds or tons of CO₂.

SIGNIFICANCE CRITERIA

Neither the State of California nor the SCAQMD have adopted permanent emission-based thresholds for GHG emissions under CEQA. The Natural Resources Agency adopted CEQA Guidelines Amendments concerning the evaluation of GHG emissions under CEQA on December 18, 2009, which became effective on March 18, 2010. These Guideline Amendments serve as guidance for lead agencies to develop the standards the agencies will use to determine the significance of GHG emissions from a particular project. The City of Huntington Beach has adopted the following two criteria from the CEQA Guidelines Amendments as significance thresholds for GHG emissions from projects where the City is serving as the lead agency under CEQA:

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The proposed project is evaluated on the basis of its consistency with the significance thresholds identified above, pursuant to guidance from the CEQA Guidelines Amendments adopted by the Natural Resources Agency.

OPR's technical advisory titled CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review states that "public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact."

The OPR further advises, "Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact" (OPR 2008, p.4). Furthermore, the OPR advisory document indicates, "In the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact', individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice" (OPR 2008, p.6).

The amended CEQA Guidelines also provide that in assessing the significance of GHG emissions, the lead agency should consider, among other things, whether the project may increase or reduce GHG emissions compared to the existing environmental setting and the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional or local plan for GHG emission mitigation or reduction.

The SCAQMD has not established emission-based significance thresholds for GHG emissions recommended for use by other lead agencies (i.e., the City of Huntington Beach). However, in December 2008, the SCAQMD adopted an interim threshold of 10,000 MTCO₂E/yr (direct and indirect operational emissions plus construction emissions amortized over 30 years) for "industrial" projects for which the SCAQMD is the lead agency. Additionally, the SCAQMD is in the process of developing guidelines for projects for which other agencies are the lead agency.

While SCAQMD's interim significance threshold for GHG emissions from industrial projects is not applicable to the Project because the City of Huntington Beach is the lead agency, the SCAQMD significance threshold of 10,000 MTCO₂E/yr will be utilized in the absence of a rulemaking to establish a numeric GHG emission threshold of significance. The numerical threshold of 10,000 MTCO₂E/yr corresponds to a threshold that captures 90% of stationary source GHG emissions. SCAQMD adopted the 90% emission capture rate as a reasonable cut-off point, based on staff estimates that the emissions from projects that will not exceed this threshold would account for slightly less than 1% of the future statewide GHG emissions target (SCAQMD 2007a).

DIRECT IMPACTS

Project Construction and Desalination Plant Operations

The proposed project would produce potable water using reverse osmosis (RO) membrane separation. The treatment processes that would be utilized would not generate GHGs directly. The desalination process does not involve heating and vaporization of the source seawater and thus does not create emissions of CO₂, CH₄, N₂O, HFCs, PFCs, or SF₆. Reverse osmosis membranes do not reject the carbon dioxide, which is naturally dissolved in the source seawater, and thus CO₂ is retained in dissolved form in the fresh drinking water created by desalination.

The project would not store or use fossil fuels on site, nor would it emit GHGs from self-generation of electricity. There are no direct fugitive emissions from the facility. As a result, project operations would not create direct sources of GHG emissions except for emissions from construction and operational vehicles. The modest number of fleet vehicles associated with the facility and the construction emissions would create GHG emissions that make up less than 5% of the project's total annual GHG emissions (95% of which are the result of indirect emissions, as discussed further below) (see Appendix W, p. 7). These emissions have been quantified and included in the overall GHG emissions total for the project.

Table 4.12-2, Construction Greenhouse Gas Emissions, and Table 4.12-3, Aggregate 30-Year Direct Operational Greenhouse Gas Emissions, show the total emissions from construction equipment, construction site electricity use, and operational emissions from passenger vehicles and delivery trucks. While construction emissions would occur over the 24-month construction period, operational emissions are aggregated over the 30-year life of the project. These emissions estimates are representative of both the co-located and stand-alone scenarios, as direct impacts under each of these scenarios would be the same.

**TABLE 4.12-2
 CONSTRUCTION GREENHOUSE GAS EMISSIONS**

EMISSION SOURCE	MTCO ₂
On Site Construction Equipment & Travel	822
Off Site Construction Equipment & Travel	1,229 to 1,233
Construction site electricity	136
Totals	2,187 to 2,191

Source: Appendix W.

**TABLE 4.12-3
 AGGREGATE 30-YEAR DIRECT OPERATIONAL GREENHOUSE GAS EMISSIONS**

EMISSION SOURCE	MTCO ₂
Operational passenger vehicle and delivery truck emissions	4,128
Totals	6,315 to 6,319

Source: Appendix W.

Substation Operations

The project also includes a 66 kv electrical substation. SF₆ gas is utilized in substation circuit breakers and can potentially leak from the equipment. SCE voluntarily reports SF₆ gas emissions and has developed measures to monitor and prevent leakage. SCE currently tracks SF₆ gas leakage on a system-wide basis. SCE SF₆ Gas Management Guidelines require proper documentation and control of SF₆ gas inventories, whether in equipment or in cylinders. Inventories are documented on both a quarterly and a yearly basis. SCE assumes that any SF₆ gas that is purchased and not used to fill new equipment is needed to replace SF₆ gas that has inadvertently leaked from equipment already in service. This allows SCE to track and manage SF₆ gas emissions. SCE currently voluntarily reports these emissions to the California Climate Action Registry, which was created by the California legislature to help companies track and reduce greenhouse gas emissions.

SCE has taken proactive steps in the effort to minimize greenhouse gas emissions since 1997. In 1997, SCE established an SF₆ Gas Resource Team to address issues pertaining to the environmental impacts of SF₆. The team developed the Gas Management Guidelines that allow for rapid location and repair of equipment leaking SF₆ gas. In addition, in 2001, SCE's parent organization, Edison International, joined the U.S. Environmental Protection Agency's voluntary SF₆ gas management program, committing SCE to join the national effort to minimize emissions of this greenhouse gas. Importantly, SCE's SF₆ emissions in 2006 were 41% less than in 1999, while the inventory of equipment containing SF₆ gas actually increased by 27% during the same time period. SCE has made a significant investment in not only improving its SF₆ gas management practices but also purchasing state-of-the-art gas handling equipment that minimizes SF₆ leakage. The new equipment has improved sealing designs that virtually eliminate possible sources of leakage. SCE has also addressed SF₆ leakage on older equipment by performing repairs and replacing antiquated equipment through its infrastructure replacement program. It is expected that the substation associated with the proposed project would have a de minimus amount of SF₆ leakage as a result of the state-of-the-art equipment and SCE's SF₆ gas management practices.

As mentioned earlier, CH₄, NO_x, and SF₆ are all less than 5% of SCE's total system-wide emissions, and therefore would not be included in the "reported" emissions under the CCAR General Reporting Protocol. Because SF₆ makes up less than 5% of SCE's total system-wide emissions, and the proposed project would incorporate state-of-the-art gas handling equipment, the proposed project's SF₆ emissions would result in a less-than-significant impact.

INDIRECT IMPACTS

Greenhouse Gas Emissions Resulting from Electricity Use

The project's ongoing source of quantifiable GHG emissions would be indirect emissions resulting from purchased electricity. The desalination facility is not anticipated to acquire electricity directly from the Huntington Beach Generating Station, and instead all of the electricity supply for the desalination facility operations is expected to be provided by SCE. Therefore, with the exception of modest direct emissions from construction and vehicle operations discussed above, the accounting of GHG emissions for the project consists entirely of indirect emissions resulting from generation of the electricity purchased from SCE.

The total net indirect GHG emissions of the proposed project from the stationary combustion of fossil fuels to generate electricity is dependent on three key factors: (1) how much electricity is used by the project, (2) sources of energy (e.g., fossil fuels, wind, sunlight) used to generate the electricity supplied to the facility, and (3) the avoided emissions (i.e., the amount of energy saved or emissions avoided as a direct result of the project's operations).

The proposed project would operate almost always, 24 hours a day for 365 days a year, to produce an average annual drinking water flow of 50 million gallons per day (MGD). Under the co-located scenario-primary route, the total baseline power use for this facility is projected to be 33.1 average megawatts (aMW), or 5,176 kilowatt hours (kWh) per acre-foot (AF) of drinking water. Under the stand-alone scenario, the total baseline power use for the facility is projected to be 35.0 aMW, or 5,479 kWh per AF of drinking water. The power use incorporates both production of fresh drinking water, as well as primary route conveyance and delivery of the water to the distribution systems of the public water agencies that would purchase water from the project. The total annual electricity consumption for the proposed project's baseline design is 289,715 MWh/yr under the co-located scenario-primary route, and 306,680 MWh/yr under the stand-alone scenario-primary route.

Under the co-located scenario-optional route, the total baseline power use for the plant is projected to be 34.4 average megawatts (aMW), or 5,392 kilowatt hours (kWh) per acre-foot (AF) of drinking water. Under the stand-alone scenario-optional route, the total baseline power use for the plant is projected to be 36.4 aMW, or 5,695 kWh per AF of drinking water. The power use incorporates both production of fresh drinking water, as well as optional route conveyance and delivery of the water to the distribution systems of the public water agencies that would purchase water from the project. The total annual electricity consumption for the proposed project's baseline design is 301,779 MWh/yr under the co-located scenario-optional route, and 318,744 MWh/yr under the stand-alone scenario-optional route.

The generation of electricity through combustion of fossil fuels typically results in emissions of CO₂, and to a smaller extent CH₄ and N₂O. Annual electricity emissions were estimated using the reported CO₂ emissions per MWh delivered for SCE. The current certified emissions factor

for SCE's 2007 delivered electricity is 630.895 pounds of CO₂ per delivered MWh of electricity (CCAR 2009).

Table 4.12-4, Indirect Greenhouse Gas Emissions from Purchased Electricity – Co-Located Scenario, and Table 4.12-5, Indirect Greenhouse Gas Emissions from Purchased Electricity – Stand-Alone Scenario, summarize the project's estimated gross indirect GHG emissions from purchased electricity for project operations, based on the most current information. Refer to Appendix W for more information.

**TABLE 4.12-4
INDIRECT GREENHOUSE GAS EMISSIONS FROM PURCHASED ELECTRICITY –
CO-LOCATED SCENARIOS**

EMISSION SOURCE	MWH/YR	MTCO ₂ PER YEAR ⁵
Project baseline design – primary route	289,715	82,908
Project baseline design – optional route	301,779	86,360

Source: Appendix W.

**TABLE 4.12-5
INDIRECT GREENHOUSE GAS EMISSIONS FROM PURCHASED ELECTRICITY –
STAND-ALONE SCENARIOS**

EMISSION SOURCE	MWH/YR	MTCO ₂ PER YEAR ⁶
Project baseline design – primary route	306,680	87,763
Project baseline design – optional route	318,744	91,215

Source: Appendix W.

ON-SITE, OFF-SITE, AND PROJECT-RELATED REDUCTION OF GREENHOUSE GAS EMISSIONS

To determine the proposed project's indirect GHG emissions, on-site, off-site, and project-related reductions in emissions must also be considered. These are GHG emission reductions that result from measures that reduce energy requirements (increased energy efficiency, potential on-site solar, recovery of CO₂, and green building design), as well as project-related emissions that will be avoided as a direct result of the project and its various components (replacing customers' SWP water with water from the proposed project).

Increased Energy Efficiency

The proposed project's high energy efficiency design incorporates state-of-the-art features that minimize facility energy consumption. One such feature is the use of a state-of-the-art pressure exchanger-based energy recovery system that allows recovery and reuse of 32.1% of the

⁵ This number is conservative because it does not take into account the California Renewables Portfolio Standard (RPS), which will result in California having 33 percent of its electricity provided by renewable resources by 2020 and therefore will significantly reduce indirect CO₂ emissions associated with electricity consumption.

⁶ This number is conservative because it does not take into account the California Renewables Portfolio Standard (RPS), which will result in California having 33 percent of its electricity provided by renewable resources by 2020 and therefore will significantly reduce indirect CO₂ emissions associated with electricity consumption.

energy associated with the RO process. A significant portion of the energy applied in the RO process is retained in the concentrated stream. This energy bearing stream is applied to the back side of pistons of cylindrical isobaric chambers, also known as “pressure exchangers.” These energy exchangers recover and reuse approximately 45% of the energy used by the RO process.⁷

Currently there are no full-scale seawater desalination facilities in the U.S. using the proposed state-of-the-art pressure exchanger energy recovery technology. All existing seawater desalination projects in the U.S. are using standard energy recovery equipment (i.e., Pelton wheels). Therefore, the Pelton wheel energy recovery system is included in the “Baseline Design” in Tables 4.12-4 and 4.12-5. More information on this technology can be found in Appendix W.

In addition to the more efficient pressure exchanger technology, the project would incorporate premium efficiency motors and variable frequency drives on desalination facility pumps that have motors of 500 horsepower or more. Under the co-located-primary route scenario, the result of these efficiency improvements would be electrical use of 28.6 aMW or 4,471 kWh/AF, which is a reduction of approximately 13.6% from the Baseline Design, for a total of 39,480 MWh/yr and associated GHG emissions of 11,300 metric tons of CO₂ per year. Under the stand-alone, primary route scenario, the result of these efficiency improvements would be electrical use of 30.3 aMW or 4,748 kWh/AF, which is a reduction of approximately 13.3% from the Baseline Design, for a total of 40,917 MWh/yr and associated GHG emissions of 11,680 metric tons of CO₂ per year. Under the co-located scenario-optional route, the result of these efficiency improvements would be electrical use of 29.7 aMW or 4,646 kWh/AF, which is a reduction of approximately 13.8% from the Baseline Design, for a total of 41,741 MWh/yr and associated GHG emissions of 11,920 metric tons of CO₂ per year. Under the stand-alone scenario-optional route, the result of these efficiency improvements would be electrical use of 31.5 aMW or 4,923 kWh/AF, which is a reduction of approximately 13.5% from the Baseline Design, for a total of 43,178 MWh/yr and associated GHG emissions of 12,360 metric tons of CO₂ per year.

Green Building Design

The proposed project would be located on a site currently occupied by an oil storage tank no longer used by the power plant. This tank and its contents would be removed and the site would be reused to construct the proposed project. The building design would follow the principles of the LEED program. LEED is a program of the United States Green Building Council, developed to promote construction of sustainable buildings that reduce the overall impact of building construction and functions on the environment by (1) sustainable site selection and development, including reuse of existing industrial infrastructure locations; (2) energy efficiency; (3) materials selection; (4) indoor environmental quality, and (5) water savings. The project applicant has determined the following LEED principles are reasonably practicable to be included in the project's building design:

⁷ 45% energy recovery and reuse” refers to the gross energy recovery potential, while the “32.1 % energy recovery and reuse” refers to the actual energy savings associated with the energy recovery system. The difference between gross and actual energy savings is due to mechanical inefficiencies of the recovery system and associated friction losses. Thus, for purposes of calculating the overall energy savings, the approximately 32% energy savings associated with the pressure exchanger was used in this analysis.

- *Construction Activity Pollution Prevention* – The project will implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan will conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit and the State of California Regional Water Quality Control Board. The project will file an NOI with the RWQCB and create a Storm Water Pollution Prevention Plan.
- *Site Selection* – The current site is developed. The main project site is not classified as prime farmland and is more than 100 feet from any wetlands or body of water. Some ancillary project items are within 100 feet of wetlands but are necessary as part of the project operations. The main Project site meets the Site Selection Criteria.
- *Brownfield Redevelopment* – The site currently houses derelict oil storage containers that will be removed as part of the project.
- *Alternative Transportation – Bicycle Storage and Changing Rooms* – Non-covered bicycle racks will be provided for 5% or more of all building users and be located within 200 yards of the entrance to the Administration component of the Administration Building. Showers and changing facilities will be located within the Administration Building.
- *Alternative Transportation – Low Emitting and Fuel-Efficient Vehicles* – Preferred parking will be provide for low-emitting and fuel-efficient vehicles for 5% of the total vehicle parking capacity of the site.
- *Stormwater Design – Quantity Control* – The project will implement a stormwater management plan and SWPPP that prevents the post development peak discharge rate and quantity from exceeding predevelopment peak discharge rate and quantity for a 10 year storm.
- *Stormwater Design – Quality Control* – The site will implement a stormwater management plan that reduces impervious cover where reasonably practicable, promotes infiltration and captures and treat stormwater runoff from 90% of the average annual rainfall using acceptable best management practices.
- *Heat Island Effect – Roof* – The administration building will meet the requirements of the roof heat island effect credit. Roofing materials will have a solar reflective index value equal or greater than 78 for at least 75% of the roof surface.
- *Light Pollution Reduction* – The administration building will meet the requirements of the interior light pollution reduction credit by reducing the input power of all nonemergency interior luminaries with a direct line of sight to any openings in the envelope by at least 50% between 11Pm and 5am. For exterior lighting, lighting power densities will not exceed ANSI/ASHRAE/IESNA Standard 90.1-2007 for the classified zone.
- *Water Use Reduction – 20% Reduction* – The administration building will employ strategies that in aggregate use 20% less water than the water use baseline calculated in the building per the requirements of LEED 2009. The facility will accomplish the 20%

of water use reduction by the use of waterless urinals and the use of high efficiency fixtures.

- *Water Efficient Landscaping* – Drought tolerant and native species of landscaping will be utilized such that the potable water consumption for irrigation will be reduced by at least 50% from a calculated midsummer baseline case.
- *Innovative Wastewater Technologies* – The administration building will utilize water-conserving fixtures to reduce the potable water use for the building sewage conveyance by at least 50%.
- *Minimum Energy Performance* – The project will demonstrate a 10% improvement in the proposed building performance rating when compared with the baseline building performance rating. The project baseline performance will be based on the Title 24-2005, part 6. The project will attain the 10% improvement over the baseline case through the use of premium efficiency pumps, improved HVAC energy ratings, and high efficiency lighting.
- *Fundamental Refrigerant Management* – The project will not utilize chlorofluorocarbon based refrigerants in the building, heating, ventilation, air conditioning and refrigeration systems.
- *Enhanced Refrigerant Management* – Refrigerants and HVAC equipment will be selected that minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The base building HVAC equipment will comply with the requirements set forth in the LEED 2009 documentation for Enhanced Refrigerant Management.
- *Storage and Collection of Recyclables* – To facilitate the reduction of waste generated by the building occupants that is hauled to and disposed of in landfills, the project will provide for a dedicated recycling area within the Administration building for the collection of paper, corrugated cardboard, glass and plastic.
- *Construction Waste Management* – In order to divert construction and demolition debris from disposal in landfills, during project construction Poseidon's contractors will recycle appropriate materials wherever feasible and redirect those items to proper recycling centers.
- *Recycled Content* – The project will utilize recycled materials wherever practical. Items that will contain recycled content include; concrete, steel framing elements, and site paving.
- *Certified Wood* – The project will utilize at least a minimum of 50% certified wood for wood based materials. The wood products will be certified in accordance with the Forest Stewardship Council's principle and criteria. The use of Certified Wood for building formwork, bracing, scaffolding and guardrails is not required per LEED 2009 and will be provided at the discretion of the project team.

- *Minimum Indoor Air Quality Performance* – To establish minimum indoor air quality performance to enhance the indoor air quality in buildings, the project will meet the minimum requirements of LEED 2009 through the use of increased natural ventilation and ventilation rate.
- *Environmental Tobacco Smoke Control* – To prevent or minimize exposure of building occupants, indoor surfaces and ventilation air distribution systems to environmental tobacco smoke, the project will prohibit smoking within the building and within 25 feet of entries, doors, air takes, and operable windows. Signage will be utilized to designate smoking areas and to prohibit smoking within the building.
- *Outdoor Air Delivery Monitoring* – The project will install permanent monitoring systems to ensure that ventilation systems maintain the minimum design requirements per LEED 2009.
- *Increased Ventilation* – The project will provide increased outdoor ventilation rates to improve indoor air quality and promote occupant comfort.
- *Construction IAQ Management Plan – During Construction* - During construction, an indoor air quality (IAQ) management plan will be prepared and implemented to protect indoor building materials and equipment from contamination.
- *Construction IAQ Management Plan – Before Occupancy* – Before occupancy and after completion of interior finishes, the building ventilation systems and interior spaces will be flushed-out per the requirements of LEED 2009.
- *Low Emitting Materials – Adhesives and Sealants* – Low-Emitting adhesives and sealants will be utilized that meet the requirements of LEED 2009.
- *Low Emitting Materials – Paints and Coatings* – Low-Emitting paints and coatings will be utilized that meet the requirements of LEED 2009.
- *Low Emitting Materials – Flooring Systems* – Low-Emitting flooring systems will be utilized that meet the requirements of LEED 2009.
- *Low Emitting Materials – Composite Wood and Agrifiber Products* – Low-Emitting Composite Wood and Agrifiber Products will be utilized that meet the requirements of LEED 2009.
- *Indoor Chemical and Pollutant Source Control* – To minimize the exposure of building occupants to potentially hazardous particulates and chemical pollutants, the following strategies will be utilized for the Project: permanent entryway systems to capture dirt and particulates from entering the building, sufficiently exhaust spaces containing hazardous gases, install new air filtration media in regular intervals, and provide containment for hazardous materials.
- *Controllability of Systems – Lighting* – Controllability of lighting systems will be provided for at least 90% of the building occupants.

- *Thermal Comfort Design* – The project HVAC system will be designed to meet the requirements of ASHRAE Standard 55-2004 to provide a comfortable thermal environment that promotes occupant productivity and well-being.
- *Thermal Comfort – Verification* – A permanent monitoring system and thermal comfort survey will be conducted to assess the building occupant thermal comfort over time.
- *Daylight and Views – Daylight* – Daylighting will be provided to at least 75% of the occupied spaces per the requirements of LEED 2009 through the use of windows and translucent exterior building panels.
- *Innovation in Design* – The project will utilize two innovations in design. The first innovation is the project's purpose; to desalinate sea water for the purpose of providing a reliable and dependable source of drinking water. The project will help augment several regional water districts' source of drinking water and help provide for the sustainability of that drinking water. The second source of innovation in design is the energy recovery of pressurized discharge water. High pressure water that is a by-product of the reverse osmosis process will be run through a turbine type energy recovery system to help augment the power requirements of the facility.
- *LEED Accredited Professional* – The project team will have at least one member that is LEED Accredited Professional.
- *Regional Priority* – By providing day lighting to 75% of the occupied spaces in the administration component of the administration building, the project will receive an additional regional priority credit.

The potential energy savings associated with the implementation of the green building design as compared to that for a standard building design are in a range of 300 MWh/yr to 500 MWh/yr. The potential GHG reduction associated with this design is between 86 and 143 metric tons of CO₂ per year. The energy savings associated with incorporating green building design features into the desalination facility structures (e.g., natural lighting, high performance fluorescent lamps, high-efficiency heating, ventilation, and air conditioning (HVAC) and compressors) are based on the assumption that such features would reduce the total energy consumption of the facility service facilities by 6% to 10%. The total actual energy reduction resulting from the use of the green building design would be determined by direct readings of the total electricity consumed by the desalination facility at the project's electricity meters and documented when the project is fully operational.

On-Site Solar Power Generation

The proposed project is anticipated to utilize a rooftop photovoltaic (PV) system for solar power generation as one element of its green building design. The desalination facility buildings would accommodate solar panels on a roof surface of approximately 39,000 square feet, with the potential to generate approximately 606 MWh/yr of electricity. The electricity produced by the on-site PV system would be used by the project and therefore would reduce the project's electricity demand on SCE. The corresponding reduction of the project's indirect emissions would be 173 metric tons of CO₂ per year. The total actual energy reduction resulting from the

use of on-site solar power generation would be determined by direct readings of the total electricity consumed by the desalination facility at the project's electricity meters and documented when the project is fully operational.

Recovery of CO₂

A small quantity of CO₂ used in the desalination facility post-treatment process is sequestered directly from the air when the pH of the source seawater is adjusted by addition of sulfuric acid in order to prevent RO membrane scaling. A larger amount of CO₂ would be delivered to the project site by commercial suppliers that would be added to the product water. Depending on the supplier, CO₂ has one of two origins: a CO₂ generating plant or a CO₂ recovery plant. Generating plants use various fossil fuels (natural gas, kerosene, diesel oil, etc.) to produce CO₂ by fuel combustion. Recovery plants produce CO₂ by recovering it from the waste streams of other industrial production facilities that emit CO₂ rich gases, such as breweries, commercial alcohol (i.e., ethanol) plants, and hydrogen and ammonia plants. Typically, if these gases are not collected via a CO₂ recovery plant and used in other facilities, such as the desalination plant, they are emitted to the atmosphere and therefore constitute a GHG release.

To the extent that it is reasonably available, the proposed project would acquire its CO₂ from a recovery operation. Use of recovered CO₂ at the proposed project would sequester 2,100 metric tons of CO₂ per year in the project product water. Verification would be provided through certificates of origin received from suppliers of CO₂ delivered to the project site indicating the actual amount of CO₂ delivered to the site, date of delivery, origin of the CO₂, and the purity of this gas. The project applicant would place conditions in its purchase agreements with CO₂ vendors that require transfer of CO₂ credits to the applicant and otherwise ensure that the CO₂ is not accounted for through any other GHG reduction program so as to avoid "double counting" of associated GHG credits.

Avoided Emissions from Replaced Imported Water

The proposed project would also avoid GHG emissions due to the introduction of a new, local source of water into Orange County, displacing imported water now delivered to customers from the SWP—a system with its own significant energy load and related GHG emissions.

One of the primary reasons for the development of the proposed project is to replace local demand for imported water with a locally produced desalinated source of water supply. Currently, Orange County imports over 50% of its water from two sources: the SWP and the Colorado River. These imported water delivery systems consist of a complex system of intakes, dams, reservoirs, aqueducts and pump stations, and water treatment facilities.

This SEIR includes an April 2010 technical memorandum by Malcolm Pirnie (Appendix W) entitled *Orange County Water Resources Mix and Implications for Desalinated Water Offsets of Imported Water Supplies*. The report was commissioned by the Municipal Water District of Orange County (MWDOC) as part of its review of the Project.

Appendix W provides an analysis of the impacts of the delivery of desalinated water supplies from the Project and assesses whether the introduction of Project water into the Orange County's water supply portfolio will result in a net reduction in the demand for imported State

Water Project supplies from the Metropolitan Water District of Southern California (Metropolitan). Based on this analysis, Malcolm Pirnie reached the following conclusions:

- Consistent with the Metropolitan Board adopted Laguna Declaration of 1952, Metropolitan is the supplemental water supplier to Orange County and is prepared to provide its service area with adequate supplies of water to meet expanding and increasing needs in the years ahead.
- Given the high costs and challenges associated with the delivery of water supplies that must pass through San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta), State Water Project (SWP) supplies will remain as supplemental supplies for Metropolitan. Thus, any new local supply development that reduces the demand for imported supplies will result in a net reduction in SWP supplies or other supplies from northern California.
- Metropolitan provides financial incentives of up to \$250/AF of water produced for qualifying desalination projects in its service area. To qualify for the incentive, proposed projects must replace an existing demand or prevent a new demand on Metropolitan's imported water supplies.
- To date, there is only one project, with a capacity of 56TAF, within the Metropolitan service area that is currently under construction, which represents just 37% of the 150TAF desalination goal discussed in the 2004 IRP Update.
- This analysis illustrate that the Project would result in a total net reduction in Metropolitan imported water deliveries of 56,000 AF per year to the Orange County water agencies that purchase water from the project (Participating Agencies), consistent with the GHG reduction plan.
- Historical demands for Participating Agencies between FY 1989-1990 and FY 2008-2009 illustrate that these agencies have consistently purchased a minimum of 185,066 AF per year of Metropolitan imported water.
- Historical demands for imported water supplies by the Participating agencies between FY 1989 and FY 2008-2009 exceed potential Project water purchases in all years.
- Projected future demands for imported water supplies by the Participating Agencies total at least 198,119 AF per year, which would be reduced to 142,119 AF per year with Project water purchases.
- Projected demands for each participating agency between 2015 and 2035 illustrate that the projected imported water purchases for each agency exceeds its potential Project water purchase amount in all years.

- Despite significant population growth within Orange County since FY 1989-1990, historical water use has remained relatively consistent due to water conservation. Given the ongoing water conservation efforts and the 20% reduction in urban water use by 2020 mandated under SB x7, it is expected that imported water demand will not increase through 2035. Consequently, imported water from the SWP that is replaced by the Project's water is not expected to be imported into Orange County to satisfy water demand from new or expanded uses developed to accommodate population growth.

Consistent with the conclusions found in Appendix W, The proposed project would supply 56,000 AF of water per year to Orange County. the desalination project would provide direct, one-to-one replacement of imported water to meet the requirements of the participating water agencies, thus eliminating the need to serve customer demand by pumping 56,000 AF of water into the region. The 2003 multi-state Colorado River quantitative settlement agreement forced Metropolitan Water District of Southern California (MWD) to reduce its pumping from the Colorado River by 53%—from 1.2 MAFY to 0.6 MAFY. As a result, MWD now operates its imported water delivery system to base load its Colorado River allotment and draw from the SWP only as needed to serve demand that cannot be met by the lower cost water available from the Colorado River Aqueduct. Thus new local supply development that reduces the demand for imported supplies will result in a reduction in SWP supplies or other supplies from the Bay-Delta region. It is anticipated that applications will be submitted to Metropolitan's Seawater Desalination Program to make the project's water eligible for the Program's financial incentives.

Because the project would displace the customers' use of 56,000 AF of imported water per year to Orange County, once in operation, the project would also avoid 175,500 MWh/yr of electricity consumption otherwise required to deliver that water to Orange County, as well as the GHG emissions associated with pumping, treatment, and distribution to the project's customers of this imported water that totals 48,190 metric tons CO₂/yr. More information on this calculation can be found in Appendix W.

Overall Reduction of Greenhouse Gas Emissions

Table 4.12-6, On and Off-Site and Project-Related Reduction of Greenhouse Gas Emissions – Co-Located and Stand-Alone Scenario and and primary and optional route, summarize the expected project-related reductions of GHG emissions resulting from the proposed project.

**TABLE 4.12-6
ON AND OFF-SITE AND PROJECT-RELATED REDUCTION OF GREENHOUSE GAS
EMISSIONS**

Source	Total Annual Reductions in Power Use (MWh/yr saved)	Total Annual Emissions Avoided (MTCO ₂ per year)
Reduction due to high-efficiency design	39,500-43,200	11,300-12,360
Green building design	300-500	86-143
On-site solar power generation	0-606	0-173
Recovery of CO ₂	N/A	1,144
Reduced water importation	175,500	48,190
Subtotal of Reduction Measures	215,300 to 219,806	60,720 to 62,010

Source: Appendix W.

SIGNIFICANCE THRESHOLDS

Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

As indicated earlier, the SCAQMD significance threshold of 10,000 MTCO₂E/yr for industrial projects is being utilized to assess the significance of the proposed project's GHG emissions, even though SCAQMD is not the lead agency. This threshold includes both operational emissions (direct and indirect) plus construction emissions. The proposed project would result in direct GHG emissions of 2,187 to 2,191 metric tons of CO₂ during project construction, and 4,128 metric tons of CO₂ aggregated over the 30 year life of the Project (424 MTCO₂ per year) under both the co-located and stand-alone scenarios. Additionally, based on the information contained in Tables 4.12-4 through 4.12-6, the proposed project would result in net indirect GHG emissions between 22,188 to 29,205 metric tons of CO₂ per year for the co-located scenario, and 25,929 to 26,160 metric tons of CO₂ per year under both the co-located and stand-alone scenarios. While these emissions are larger than the 10,000 MTCO₂E/yr threshold, the proposed project has incorporated project design features included in its Energy Minimization and Greenhouse Gas Reduction Plan, which would offset the project's GHG emissions entirely, and as a result impacts would be less than significant.

The proposed project would incorporate project design features that require a one-time purchase of GHG offsets or RECs for the Project's direct GHG emissions associated with Project construction and vehicle use during operation of the Project. This would offset direct emissions of 6,315 to 6,319 metric tons of CO₂ (2,187 to 2,224 metric tons for construction and 4,128 metric tons for vehicle operations over the project's 30-year life).

Project design features would require the purchase of offsets or RECs to cover estimated net indirect GHG emissions over the life of the project (equivalent to 22,188 to 29,205 metric tons of CO₂ per year), as well as an annual reporting process to ensure that the applicant maintains a zero net GHG emissions balance.

With incorporation of these project design features, the Project would have a net zero increase in GHG emissions. Therefore, the Project would have emissions below SCAQMD's 10,000 MTCO₂E/yr threshold, and Project impacts would be less than significant. Further, because the Project design features require the project to maintain a zero net GHG emission balance, the project would not cause an increase in GHG emissions above the existing baseline, and therefore would have no GHG emission impact on the environment.

Importantly, this finding is consistent with recommendations made by CARB as they relate to netting out the emissions associated with imported water that is replaced with local supplies by desalination projects. CARB analyzed the Project applicant's Energy Minimization and Greenhouse Gas Reduction Plan for its Carlsbad Desalination Facility, which is substantively identical to the Plan for this Project. In a letter dated August 5, 2008 from CARB to the California Coastal Commission, CARB indicated that it had analyzed the Energy Minimization and Greenhouse Gas Reduction Plan for the Carlsbad Desalination Facility, and that the amount of emissions reduction that should be required "need not exceed the net impact; that is, the direct emissions and any new indirect emissions from the project, less emissions that would be associated with providing an equivalent amount from existing supplies" (CARB 2008b).

Moreover, the CARB letter notes that the the GHG plan for Carlsbad was offered voluntarily, and futher notes that the direct emissions from that project were minimal.

Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The proposed project is also being evaluated based on whether it would conflict with any applicable plan, policy or regulation adopted for the purpose of reducing greenhouse gases.

While AB 32 does not regulate the project's direct or indirect GHG emissions (and there are no other statewide GHG regulatory programs that are applicable to this project), the project is being evaluated on whether it would conflict with AB 32's statewide goals of reducing GHGs through actions such as energy efficiency, green building design, renewable energy generation and reduced water importation.

The proposed project would incorporate high-efficiency design, green building design, solar power generation, and recovery of CO₂ in order to reduce its emissions through energy efficient design features. In addition, the project's design features include GHG offsets, that would entirely offset the project's net GHG emissions above the existing baseline. With the incorporation of the project design features, project GHG reductions would result in a net zero emission of GHGs. As a result, the proposed project would not conflict with AB 32.

In addition to the project resulting in no conflict with AB 32, the proposed project would not conflict with any other plans, policies, or regulations intended to reduce GHG emissions, as indicated below. The City of Huntington Beach has not adopted a Climate Action Plan or any other plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and therefore the Project does not conflict with any such plan, policy or regulation.

CARB's Scoping Plan provides an outline for actions to reduce California's GHG emissions. The Scoping Plan requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. At this time, no mandatory GHG regulations or finalized agency guidelines would apply to this project, and therefore the Project does not conflict with any such regulations or guidelines.

SB 375 addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 provides incentives for streamlining CEQA requirements by substantially reducing the requirements for "transit priority projects," as specified in SB 375, and eliminating the analysis of the impacts of certain residential projects on global warming and the growth-inducing impacts of those projects when the projects are consistent with the Sustainable Communities Strategy or Alternative Planning Strategy. The City is not anticipating a zone change or change in land use for the proposed project site in response to SB 375, and because the proposed project consists of a seawater desalination facility and associated infrastructure, it would not result in a significant number of vehicle trips during the operational phase. As a result, the proposed project would not conflict with the goals of SB 375.

As noted in the discussion of environmental setting, the California Global Warming Solutions Act of 2006 (Health and Safety Code Section 38501(a)), cites rising sea levels as a potential adverse impact of global warming. The sea level rise projected by the documented models described earlier in this section spanned a fairly large range. However, it appears that the

various projections for sea level rise could affect primarily the intake and discharge features of the project. The project site is proposed to be at elevations ranging from 9.0 to 14.0 feet above AMSL, with all building foundations above 10.0 feet AMSL. Therefore the project site will be protected from a potential two feet rise in sea level. In addition, earthen berms around the site are sufficient for protection from surges that could occur from waters to the south. It is not anticipated that a rise in sea level of up to 2 feet or more within the life span of the project would result in substantial increase in exposure of the project to potential adverse impacts. Accordingly, no significant impacts from this potential adverse effect of global warming, as identified in the California Global Warming Solutions Act of 2006, would occur.

Since the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases, no significant impact would occur.

SUMMARY OF IMPACTS

No significant impacts related to climate change were identified.

MITIGATION MEASURES

As no significant impacts have been identified, no mitigation measures are required. As noted in this section, it is anticipated that the City of Huntington Beach will require that the project design features relating to GHG emissions will be incorporated as conditions of approval for the project.

UNAVOIDABLE SIGNIFICANT IMPACTS

None have been identified.

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